PATENT CLAIMS

1. A method for discharging and airstream (1) from a cooking area, comprising the steps
passing the airstream (1) through a sorbent (5) for sorption of water or water vapor present in the airstream (1),
regeneration of the sorbent (5).

2. The method according to claim 1,
characterized by the discharge of the airstream (1) from a room and returning at least a portion of the airstream (1) back to the room downstream from the sorbent (5).

3. The method according to claim 1 or 2,
characterized by the separation of fat and oil present in the airstream (1) upstream from the sorbent (5) by means of a fat filter (4).

4. The method according to any one of claims 1 through 3,
characterized by the separation of odoriferous substances present in the airstream (1) by means of an odor filter (7) preferably downstream from the fat filter (4) or, when using a sorbent (5) that can also separate odors, by means of the sorbent (5).

5. The method according to any one of claims 1 through 4,
characterized by dividing the airstream (1) into a first air substream (1a) and a second air substream (1b) upstream from the sorbent (5),
passing the first air substream (1a) through the sorbent (5), and
passing the second air substream (1b) around the sorbent (5), and
combining the first air substream (1a) and the second air substream (1b) downstream from the sorbent (5) and sending

the combined first air substream (1a) and the second air substream (1b) back into the room.

6. The method according to claim 5,
characterized by adjusting the residual moisture content of the combined airstream by adjusting the volume flow ratio between the first air substream (1a) and the second air substream (1b), preferably to a ratio such that the combined airstream has a moisture level corresponding to the moisture level in the absence of a cooking process.

7. The method according to any one of claims 1 through 6,
characterized by sorption of the water or the water vapor by means of $CaCl_2$ and/or LiCl and/or silica gel and/or zeolite.

8. The method according to any one of the preceding claims 1 through 7,
characterized by regeneration of the sorbent (5) by desorption of the sorbent (5) heating the sorbent (5) to a temperature suitable for desorption of water from the sorbent (5) used.

9. The method according to claim 8,
characterized by regeneration of the sorbent (5) when it is not necessary to discharge an airstream (1) above the cooking area.

10. The method according to any one of claims 8 through 9,
characterized by producing a regeneration airstream (1') through the sorbent (5) during the regeneration process, whereby preferably the regeneration airstream (1') is smaller than the airstream (1) in the cooking process.

11. The method according to any one of the preceding claims 8 through 10,

characterized by heating the sorbent (5) directly by means of a heating device (10) embedded in the sorbent (5), preferably in the form of heating coils, or indirectly, preferably by microwave radiation adjusted for water, or by heating indirectly by heating the regeneration airstream (1') upstream from the sorbent (5).

12. The method according to any one of the preceding claims 10 through 11,
characterized by returning the regeneration airstream (1') to the room in order to humidify the room, preferably it the winter.

13. The method according to any one of the preceding claims 10 through 12,
characterized by condensation of the moisture content in the regeneration airstream (1') by means of a condensation unit (6).

14. The method according to claim 13,
characterized by cooling the condensation unit (6) by room air or outside air or water, preferably from the building water system or by means of a heat pump, preferably a refrigeration system or a Peltier element.

15. The method according to any one of the preceding claims 10 through 14,
characterized by dividing the regeneration airstream (1') upstream from the sorbent (5) into a first regeneration air substream (1'a) and a second regeneration air substream (1'b),
passing the first regeneration air substream (1'a) through the sorbent (5) and
passing the second regeneration air substream (1'b) around the sorbent (5) and
combining the first regeneration air substream (1'a) and

the second regeneration air substream (1'b) downstream from the sorbent (5) and returning the combined regeneration airstream (1') back to the room.

16. The method according to any one of the preceding claims 10 through 14,
characterized by dividing the regeneration airstream (1') into a first regeneration air substream (1'a) and a second regeneration air substream (1'b) upstream from the sorbent (5),
passing the first regeneration air substream (1'a) through the sorbent (5), and
passing the second regeneration air substream (1'b) around the sorbent (5), and
returning the first regeneration air substream (1'a) to the inlet side of the sorbent (5), and
sending the second regeneration air substream (1'b) as a cooling airstream through the condensation unit (6) and preferably returning the second regeneration air substream (1'b) to the room downstream from the condensation unit (6).

17. The method according to any one of the preceding claims 13 through 16,
characterized by discharging the condensed water into a drain or a storage container.

18. A vapor-discharging device for discharging an air stream from a cooking area with a housing (2);
a fan (8) for conveying the airstream (1) through the vapor-discharging device;
a sorbent (5) arranged in an airstream (1) for sorption of water or water vapor in the airstream.

19. The device according to claim 18,
characterized in that
a fat filter (4), preferably an expanded metal filter

and/or a nonwoven filter and/or an eddy current filter is/are provided for separation of fat, oil and water of condensation from the airstream (1) preferably upstream from the sorbent (5).

20. The device according to claim 18 or 19,
characterized in that
an odor filter (7), preferably an activated carbon filter is provided is preferably provided downstream from the fat filter for separation of odors from the airstream.

21. The device according to any one of claims 18 through 20, characterized in that a regeneration device is provided for desorption of water out of the sorbent (5).

22. The device according to claim 21,
characterized in that the regeneration unit has a heating device (10) either for direct heating of the sorbent (5), preferably in the form of a heating device (10) arranged in the sorbent or a microwave heating device arranged around the sorbent (5), or for indirect heating of the sorbent (5) by heating a regeneration airstream (1') passed through the sorbent (5) upstream from the sorbent (5).

23. The device according to any one of claims 18 through 21, characterized in that
the fan creates a regeneration airstream through the sorbent (5), said regeneration airstream being smaller than the airstream.

24. The device according to any one of claims 18 through 23, characterized in that
the regeneration device has a condensation unit (6) preferably in the form of a heat exchanger (12) or a capacitor according to the crosscurrent or countercurrent technology, arranged downstream from the sorbent (5).

25. The device according to claim 24,
characterized in that
the condensation unit (6) includes and outside wall of the housing (2) of the vapor-discharging device, said outside wall being cooled by free convection of the room air on the outside of the outside wall and water being condensed on the inside of the outside wall.

26. The device according to claim 24,
characterized in that
the condensation unit (6) has a cooling device so that the cooling device has a second fan (13) for cooling the condensation unit (6) by means of ambient air.

27. The device according to claim 26,
characterized in that
the cooling device has a refrigeration cycle or a Peltier element whereby preferably an air guidance device is provided between the hot side of the refrigeration cycle or the Peltier element and the sorbent (5) in order to use air heated by the hot side of the refrigeration cycle or the Peltier element for heating the sorbent (5) in the regeneration process.

28. The device according to any one of claims 25 through 27,
characterized in that
a condensate-collecting device preferably in the form of a trough (15) or a pan which is connected to a drain (16) or collecting container is provided on the condensation unit (6).

29. The device according to any one of claims 18 through 28,
characterized in that
the sorbent (5) is provided in the form of a bulk material in an air-permeable bulk material container, or

the sorbent (5) is designed as a porous molded article, or

the sorbent (5) is in the form of a plurality of plate-like porous molded articles or a plurality of plate-like flat bulk material containers which are arranged one after the other in the direction of flow or in parallel.

30. The device according to claim 29,
characterized in that
the sorbent (5) adheres to a porous carrier material such as an open-pore sponge, a tile material or a textile, preferably corrugated or having a honeycomb structure to provide a large surface area.

31. The device according to claim 30,
characterized in that
multiple carrier materials provided with sorbent (5) are arranged one after the other in the direction of flow or in parallel.

32. The device according to any one of claims 18 through 31,
characterized in that
the sorbent (5) is formed by $CaCl_2$ and/or LiCl and/or silica gel and/or zeolite and/or SWS (selective water sorbent).

33. The device according to any one of claims 18 through 32,
characterized in that
a bypass (22) for bypassing is provided for a air substream (1b) or for a partial regeneration airstream (1'b) around the sorbent (5) and an air-dividing device is provided to adjust the volume flow ratio between the airstream in the bypass line (22) and the airstream in the main line (3).

34. The device according to claim 33,
characterized in that
the air-dividing device is formed by a throttle valve which

is preferably arranged in the main line (3) downstream from the sorbent (5).

35. The device according to claim 32 or 23,
characterized in that
the heat exchanger (12) is arranged in the bypass line (22), and a valve device (23) is provided downstream from the sorbent (5) in the main line (3), establishing a connection to the bypass line (22) downstream from the heat exchanger (12) in a first position and
in a second position, sending the regeneration airstream (1'a) to the heat exchanger (12).

36. The device according to any one of claims 21 through 35,
characterized in that
a connecting line (26) is provided from the heat exchanger (12) to the main line (3) upstream from the heating device (10) for further conveyance of the regeneration airstream (1'a).

37. The method for operating the vapor-discharging device according to any one of the preceding claims 18 through 36,

characterized in that
the vapor-discharging device may be used as a room air humidifier and/or as a room air dryer.

38. The method according to claim 37,
characterized in that
in the case of a vapor-discharging device according to the design having an extractable shield, the extracted position can be used as a signal for the exhaust operation and the retracted position can be used as a signal for regeneration operation.